CLAIMS

1. A method for converting an amino ether alcohol to an amino ether amine, the method comprising contacting a catalyst comprising at least one of zinc oxide and a zinc salt, and at least one of copper oxide and a copper salt, with a vapor phase mixture comprising the amino ether alcohol and an amine.

2. The method of claim 1, wherein the amino ether alcohol has the formula $NR^1R^2R^3$, wherein R^1 and R^2 each individually is selected from the group consisting of H, C1-C10 alkyl, a C6-C10 aryl, and a C6-C10 aralkyl, R^3 is a C4-C10 alkyl group having within it an ether linkage and also containing at least one hydroxyl group, and the amine has the formula, NHR^4R^5, wherein R^4 and R^5 each individually is H, a C1-C10 alkyl, a C6-C10 aryl, or a C6-C10 aralkyl group, provided that no more than one of R^4 and R^5 is H.

3. The method of claim 1, wherein the amino ether alcohol is dimethylaminoethoxyethanol.

4. The method of claim 1, wherein the amine is a monoalkylamine and/or a dialkylamine.

5. The method of claim 1, wherein the amine is monomethylamine and/or dimethylamine.

6. The method of claim 1, wherein the contacting is performed in a continuous process comprising passing the vapor phase mixture over the catalyst.

7. The method of claim 1, wherein the contacting is performed at a temperature ranging from 120 °C to 300 °C and a pressure ranging from 0 to 500 psig (101 to 3549 kPa).

8. The method of claim 1, wherein the contacting is performed at a temperature ranging 180 °C to 220 °C and a pressure ranging from 0 to 100 psig (101 to 791 kPa).

9. The method of claim 8, wherein the contacting is performed at a pressure of 40 to 80 psig (377 to 653 kPa).

10. The method of claim 1, wherein the contacting is performed in a fixed bed tubular reactor.

11. The method of claim 1, wherein a weight ratio of copper to zinc in the catalyst ranges from 0.3 to 6.

12. The method of claim 1, wherein a weight ratio of copper to zinc in the catalyst ranges from 0.4 to 3.

13. The method of claim 1, wherein the catalyst further comprises a promoter comprising at least one of an alkali metal, an alkaline earth metal, lanthanum, cerium, praseodymium, neodymium, samarium, europium, gadolinium, and terbium, the promoter present at 0.05 to 5 wt%, based on a total weight of the catalyst.

14. The method of claim 13, wherein the promoter is present at 0.2 to 2 wt%, based on the total weight of the catalyst.

15. The method of claim 13, wherein the promoter is present at 0.3 to 1.5 wt%, based on the total weight of the catalyst

16. The method of claim 13, wherein the promoter comprises at least one of potassium, rubidium, and cesium.

17. The method of claim 13, wherein the promoter comprises at least one of magnesium, calcium, and strontium.

18. The method of claim 13, wherein the promoter comprises at least one of lanthanum, cerium, and praseodymium.

19. The method of claim 13, wherein the catalyst further comprises at least one of Al_2O_3 and SiO_2.

20. The method of claim 1 wherein the method further comprises, prior to said contacting, treating the catalyst with hydrogen under conditions sufficient to form an activated catalyst.

21. The method of claim 20 wherein the hydrogen is generated by interaction of the catalyst with an organic compound.

22. The method of claim 1 wherein the vapor phase mixture further comprises hydrogen.

23. A method for converting dimethylaminoethoxyethanol to an amino ether amine, the method comprising:

contacting a catalyst with hydrogen gas to produce an activated catalyst; and

contacting the activated catalyst with a vapor phase mixture comprising dimethylaminoethoxyethanol and at least one of methylamine and dimethylamine;

wherein the catalyst comprises the following materials in the following amounts, based on total catalyst weight:

20 to 70 wt% copper oxide,

20 to 65 wt% zinc oxide, and

0.3 to 1.5 wt% of at least one of potassium and cesium.